

Figure 1 – Real Time Flow Monitoring

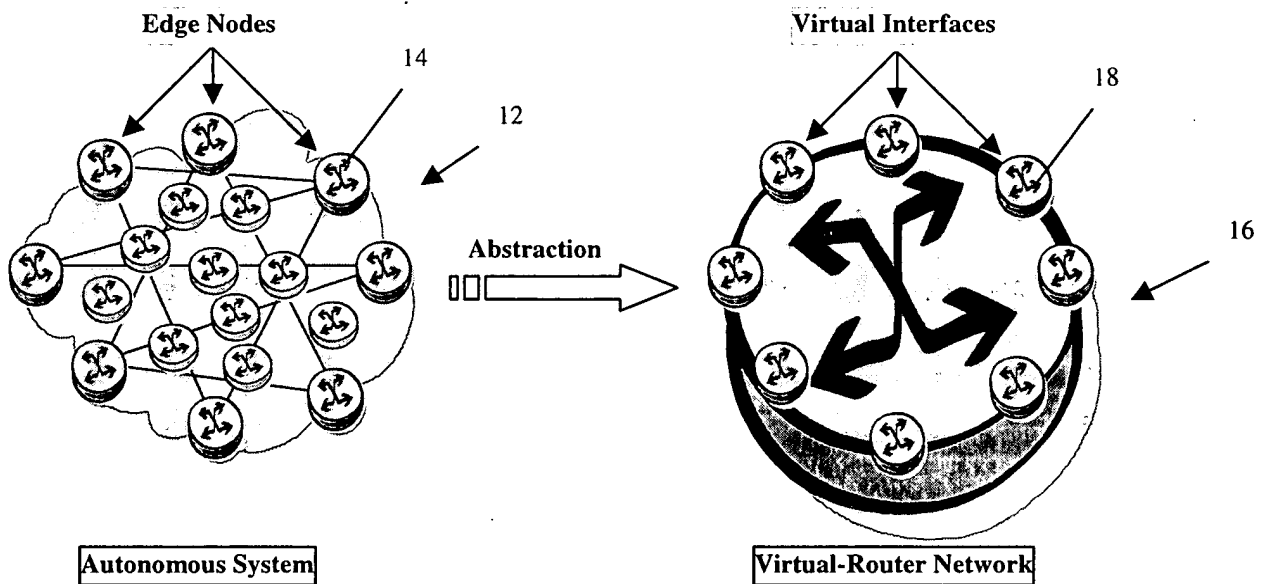


Figure 2 – Virtual-Router Network Paradigm

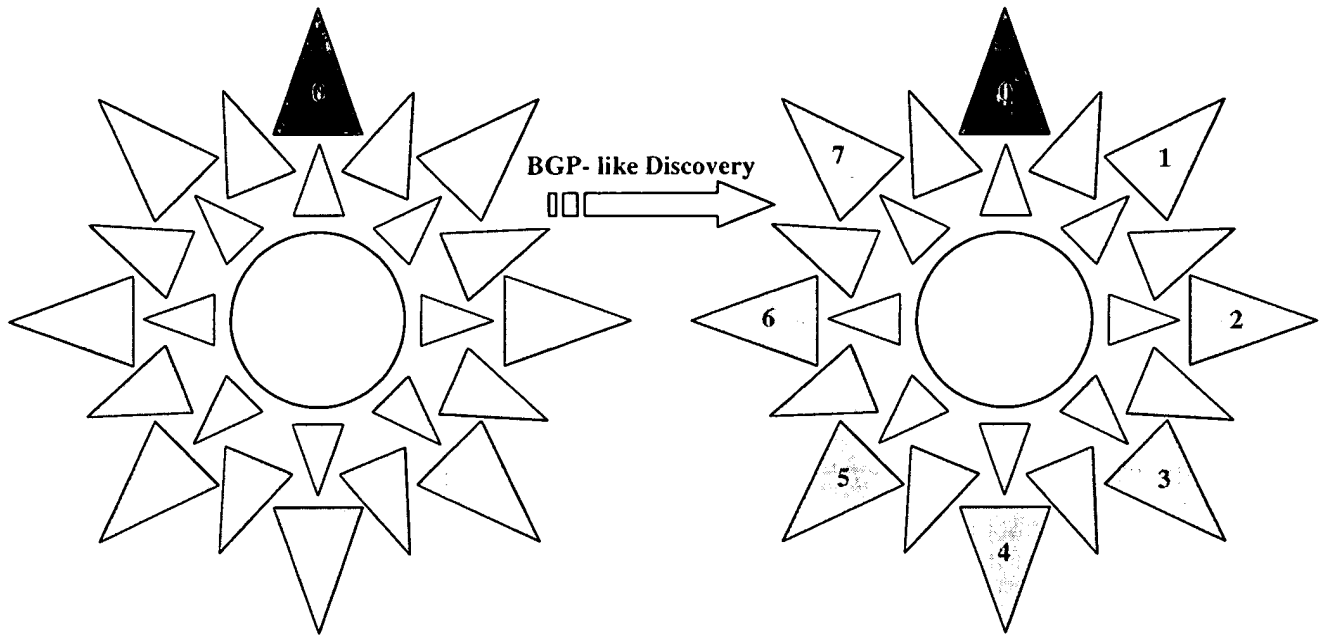


Figure 3 – Metering Points Discovery, initial

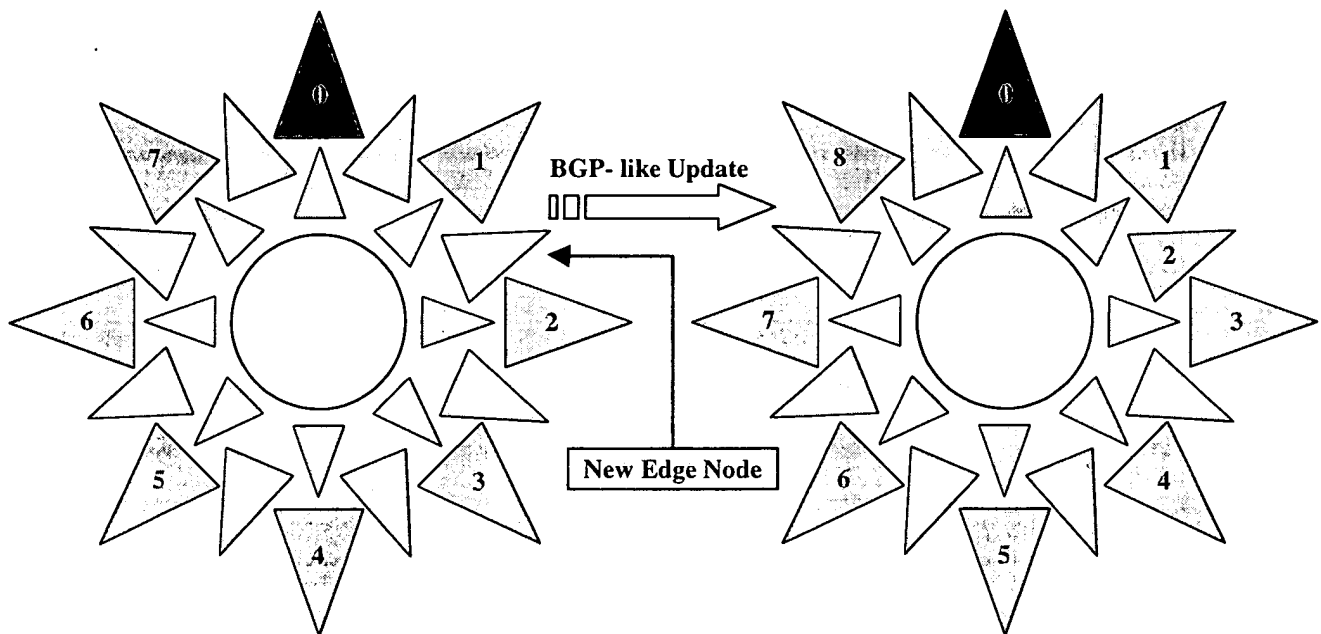


Figure 4 – Metering Points Discovery, addition of an edge node

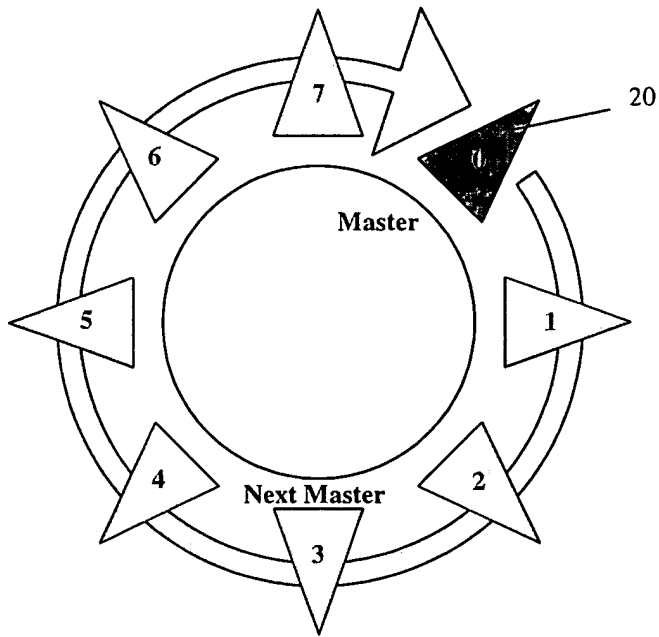


Figure 5 a.

Master Election

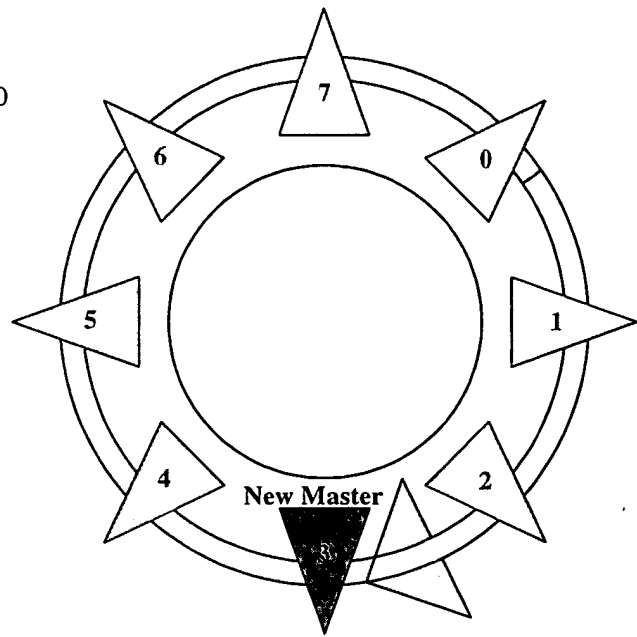


Figure 5 b.

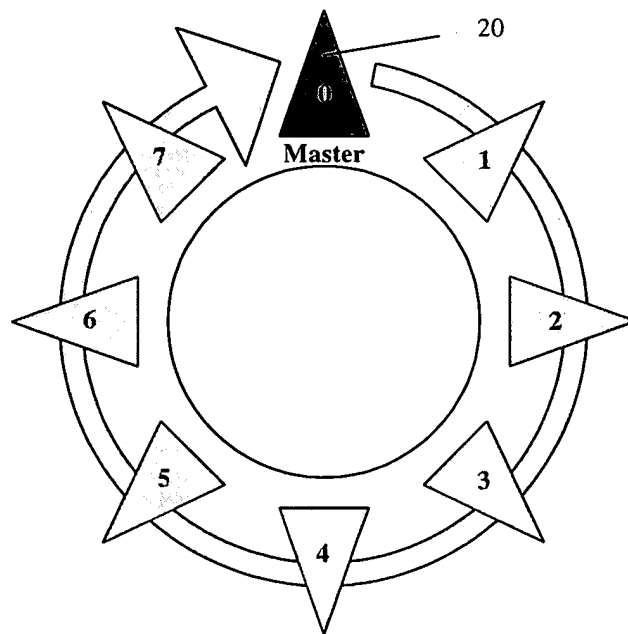
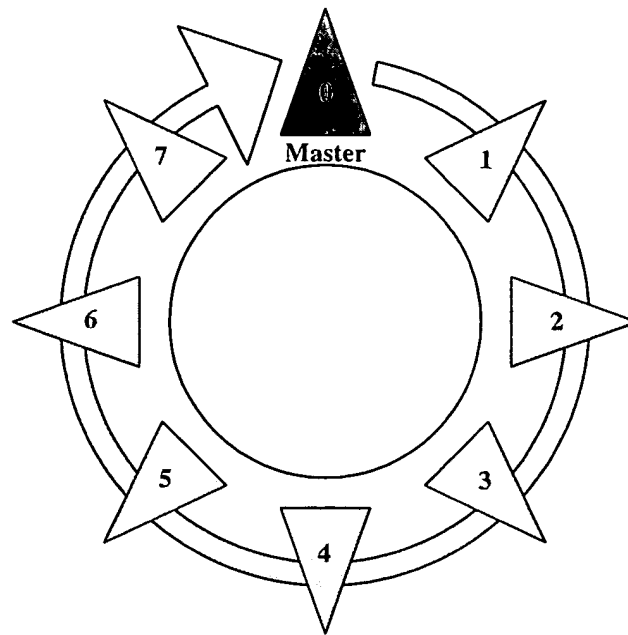
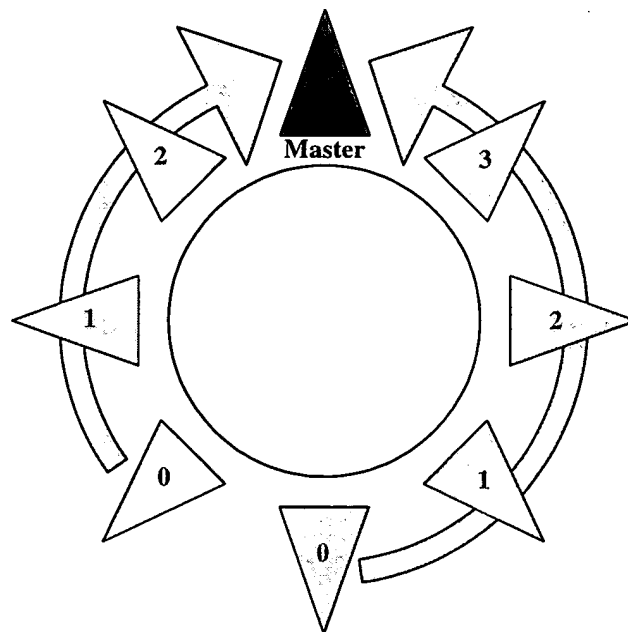


Figure 6 – Flow Monitoring Configuration



**Figure 7 – Flow Aggregation**



**Figure 8 – Optimized Flow Aggregation**

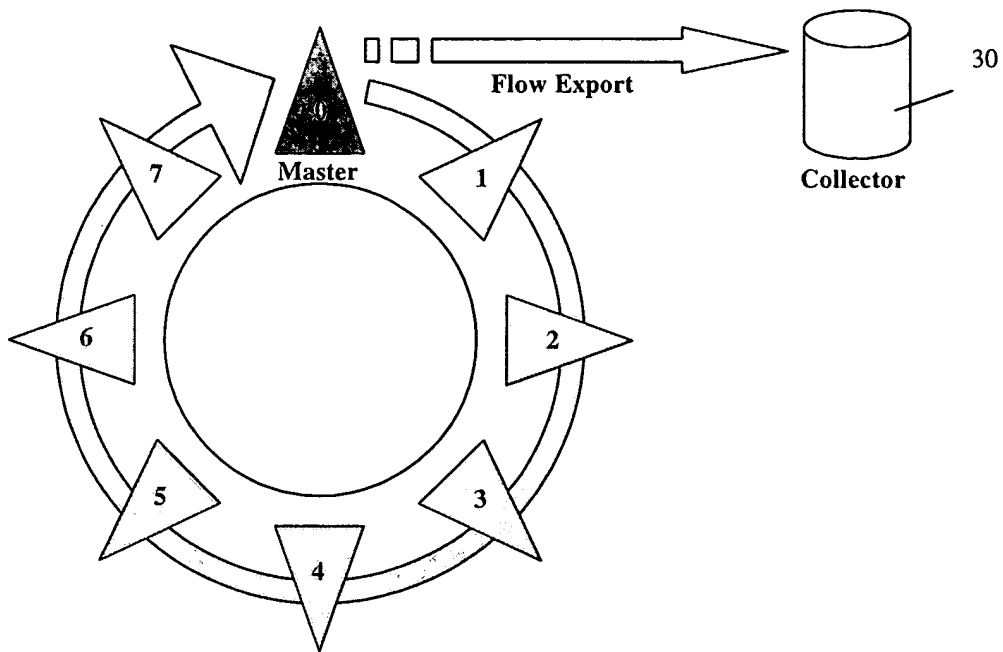


Figure 9 – Flow Collection

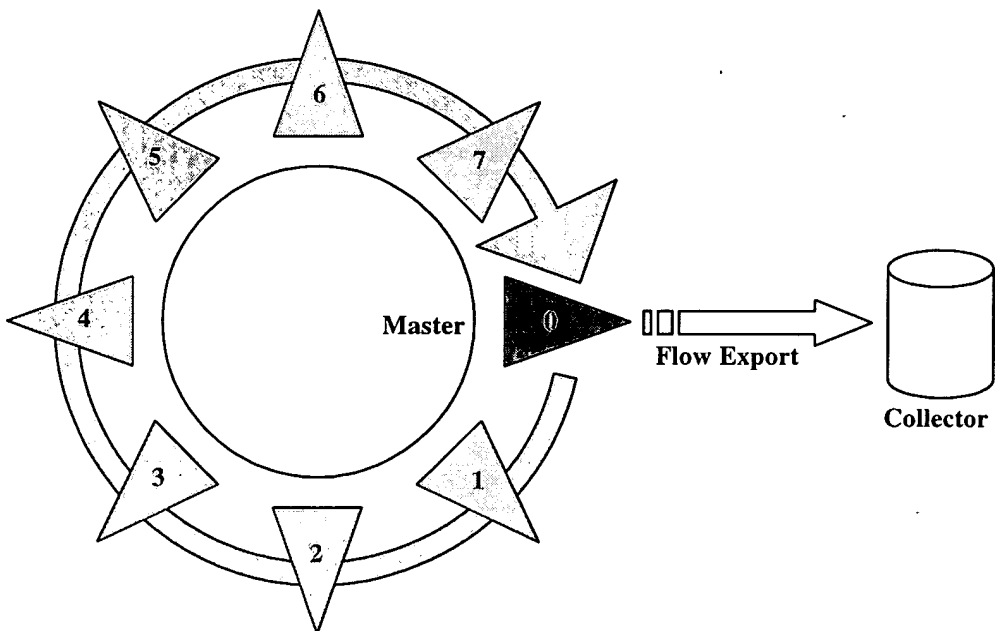


Figure 10 – Master changes, no impact on Flow Collection

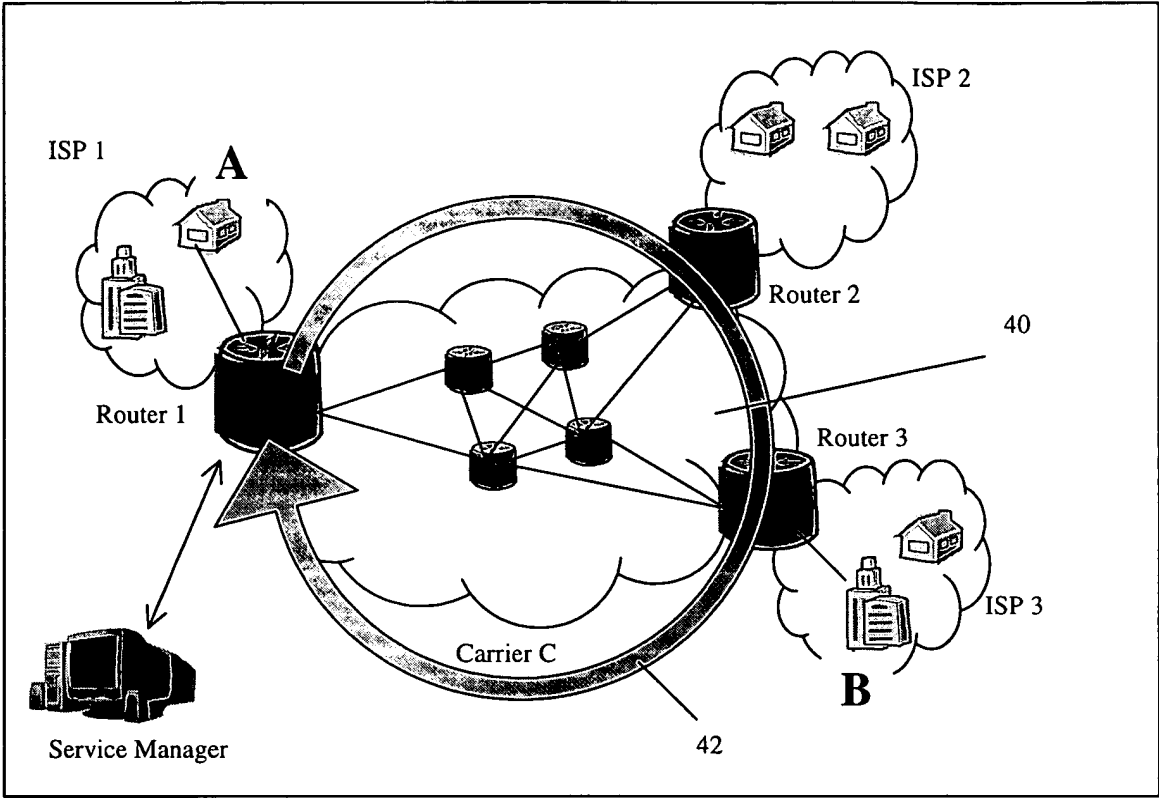


Figure 11: Scope of the invention

	Source	Destination	Total PDU Nb	Other counters	Delay[t] <key, timestamp>
flow record 1	xxx	xxx	xxx	...	
flow record 2	A	B	1500	...	<k0, t0>
					<k1, t0+i>
					<k2, t0+(2*i)>
					...
					<kn, t0+(n*i)>
flow record 3	xxx	xxx	xxx	...	

Figure 12: Flow table at Router1

	Source	Destination	Total PDU Nb	Other counters	Delay[t] <key, timestamp>
flow record 1	xxx	xxx	xx	...	
flow record 2	xxx	xxx	xx	...	
flow record 3	A	B	1500	...	<k0, t0+d0>
					<k2, t0+(2*i)+d2>
					...
					<kn, t0+(n*i)+dn>
flow record 4	xxx	xxx	xxx	...	

Figure 13: Flow table at Router3

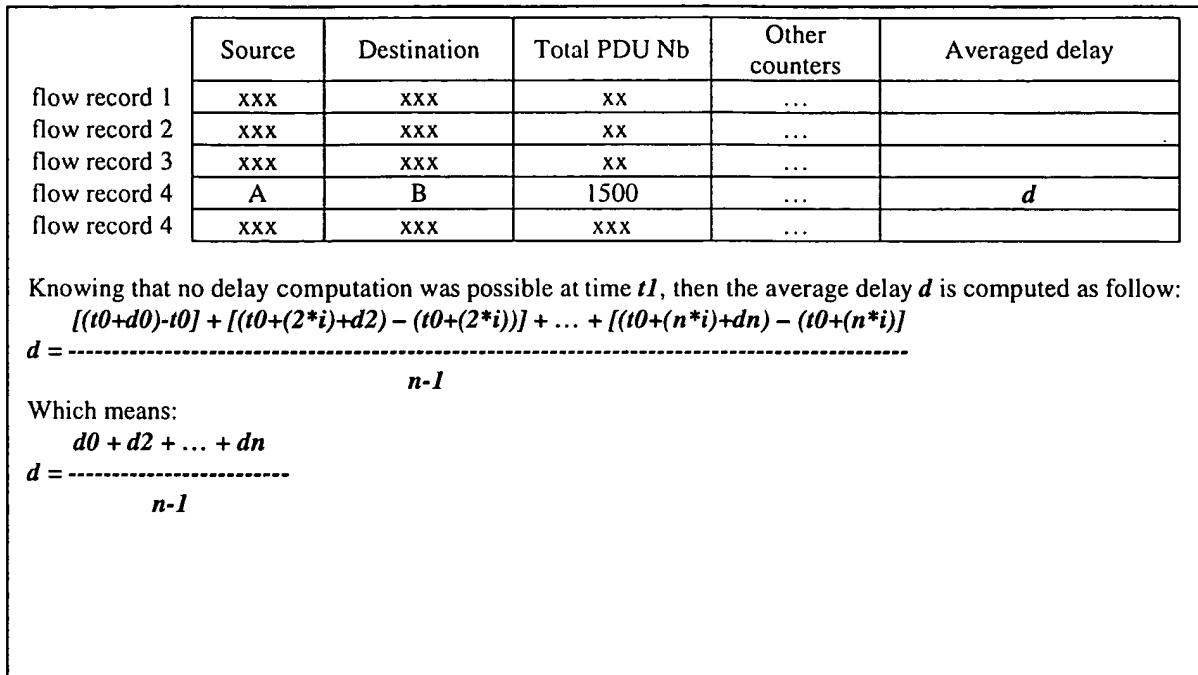


Figure 14: Aggregated flow table with per flow delay computation before export to the service manager

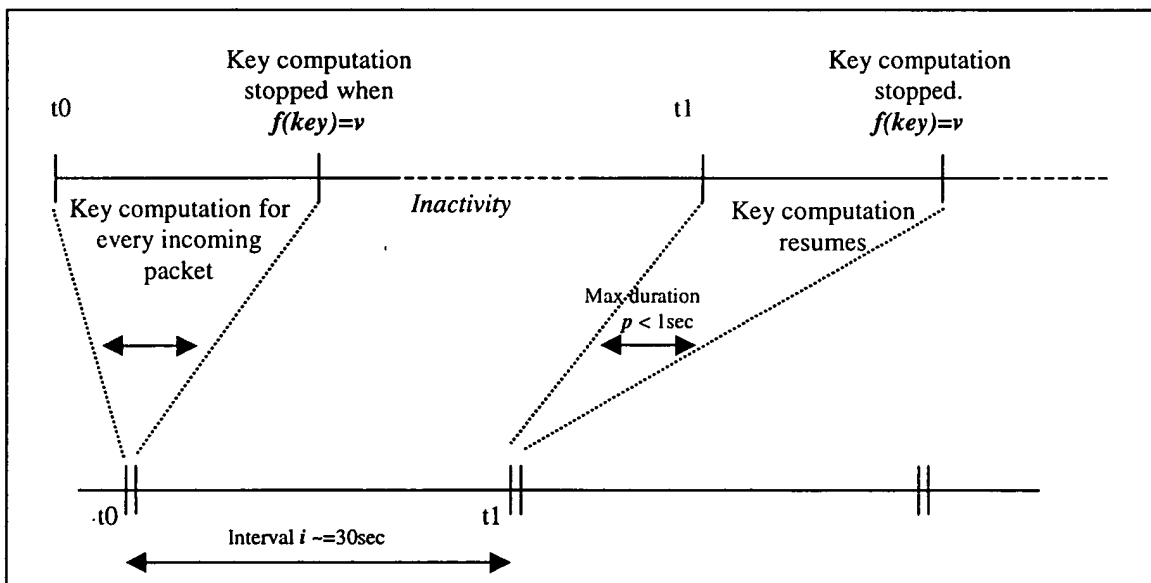


Figure 15: Load over time for the routers